## BRIEF DESCRIPTION OF THE DRAWINGS

0018 Figure 1 is a schematic representation of a typical plasma etching system according to the prior art.

0019 Figure 2 is a schematic representation of a plasma etching system showing selected features of the present invention.

0020 Figure 3 is a schematic representation of a heating chamber according to the present invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

0021 The method and apparatus according to the present invention is more clearly described by referring to Figure 2. Figure 2 is a schematic representation of a multi-chamber processing system for carrying out shallow trench isolation (STI) etching. As previously discussed with reference to Figure 1, several modular processing chambers may be attached to the processing system for carrying out different procedures. An exemplary system for example is the Centura 5200 ™ commercially

available from Applied Materials, Inc. of Santa Clara, California. The multiple chamber system has the capability to transfer a wafer between its chambers without breaking the vacuum and without having to expose the wafer to moisture or other contaminants outside the multiple chamber system. An advantage of the multiple chamber system is that different chambers in the multiple chamber system may be used for different purposes in the entire process. The process may proceed uninterrupted within the multiple chamber system, thereby preventing contamination of wafers that often occurs when transferring wafers between various separate individual chambers (not in a multiple chamber system) for different parts of a process.

0022 For example, referring to Figure 2, in an STI process several different etching chambers optimized for different etching steps may be used as shown, for example, at 20, 22, 24, and 26 , while another chamber, for example 28 may be used for wafer orientation, and other chambers, for example, 30 and 32, used for loading and unloading process wafers. In the method and apparatus according to the present invention, a heating chamber,

34, is added to the multi-chamber system to heat the process wafer prior to transfer by robotic arm 36 to a loadlock chamber e.g., 30 or 32 for unloading. According to the present invention an external heat exchanger 38 is fluid communication by lines 39 and 40 with a heat exchange surface (see Figure 3) disposed in chamber 34 and in contact with a process wafer for heating the process wafer.

0023 According to the present invention, the heating chamber is used to heat the wafer to a temperature sufficient to vaporize any condensed acidic residue, for example HBr, remaining from the etching process on the wafer surface or on loose particles adhering to the wafer surface. While vaporizing of the acidic residue, a vacuum system is simultaneously used to remove the vaporized gases from the chamber. Suitable pressures may be maintained with a range of 10 mTorr to 500 mTorr. A suitable wafer temperature for vaporizing HBr from the wafer surface has been found to be within a range of about 75°C to 100°C, although most preferably the wafer temperature is about 80°C. Further, it has been found that the removal of acidic contamination, for